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A view of the harbor and city of Victoria, British Columbia

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The JOURNAL *of* GEOGRAPHY

A MAGAZINE FOR SCHOOLS

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VOLUME XXVIII MARCH, 1929 NUMBER 3

THE ELEMENT OF ADVENTURE IN TEACHING AND LEARNING GEOGRAPHY*

WILLIAM C. BAGLEY
Teachers College, New York City

While a layman cannot but feel honored when invited to speak to a group of specialists upon the problems of their own field, he clearly owes it to his auditors to tell them why he is so bold as to accept the invitation. I should say at the outset, then, that my only excuse for appearing on this program is that I have a real affection for geography, and in this respect, if in no other, I am confident that I can meet the geographers on something approaching a common ground. Superficial and inadequate as my acquaintance with your field is, it has been to me a most pleasant and stimulating acquaintance. I am naturally desirous that as many people as possible should get similar pleasure and stimulation from the same source; hence my interest in the place that geography has attained in the scheme of universal education, and my keen desire to promote in whatever small way I can the effectiveness of its teaching.

Having said this, however, I should hasten to add that I have no pedagogical cure-all to purvey to you. While I am a professor of education, and as such have perpetrated innumerable lectures and articles, as well as a few books, on methods of teaching, I have long been convinced that efforts to impose general patterns of teaching on diverse types of subject-matter are not only of little avail but sometimes fairly disastrous. Good teaching procedures, in my judgment, must grow out of the subject-matter to be taught rather than deduced from theoretical postulates and injected into the subject-matter by specialists in education.

THE IMPORTANCE OF THE "TEACHER-SCHOLAR"

I may say parenthetically that most of us here at Teachers College are pretty thoroly in agreement on this point. Our develop-

* Presented at the New York meeting of the National Council of Geography Teachers, December 26, 1928.

ment during the past decade, indeed, has been decidedly in the direction of a larger emphasis upon the subject-matter fields. We believe that, while education needs some students who view the problem as a whole, it also needs a very great abundance of what I like the term teacher-scholars, that is, men and women who know their specialized subjects in and out and all around, who love their subjects with a personal and passionate devotion, and whose chief aim in life is to get others to know and love these subjects. The chief difference between the teacher-scholar and the research-scholar is that the latter is primarily interested in the growth of his subject upward—in its vertical expansion so to speak thru the discovery of new facts and new laws; while the former—the teacher-scholar—is primarily interested in the growth of his subject outward, in its horizontal expansion thru the building of its truths into the experience of as many members of each generation as possible.

It is unfortunate to draw invidious distinctions between the work of the teacher-scholar and the work of the research-scholar, for the efforts of both are essential to progress. One may say with truth that modern civilization has grown with the discovery of knowledge; and one may say with equal truth that modern civilization has grown with the dissemination of knowledge. The fifteenth century, from which modern civilization is usually dated, gave birth not only to new knowledge; it was not only the century of Prince Henry and Columbus and Vasco Da Gama; it gave birth also to the printing press; it was the century of Gutenberg and Caxton. The closing decades of the eighteenth century, which we think of as opening the way for contemporary civilization, not only witnessed the triumph of James Watt in making the power of steam turn wheels; they witnessed almost simultaneously the feeble beginning of the universal school. Light and yet more light, enlightenment and ever wider enlightenment: these are the complementary forces that have played the major part in modern progress. Neither one, in my judgment, can claim precedence above the other.

THE PRIMACY OF GEOGRAPHY AS A CONTENT SUBJECT IN UNIVERSAL EDUCATION

It is of large significance, I believe, that in the development of universal education, geography was the first field of specialized

knowledge to be accorded a place in a curriculum designed for all the children of all the people. In its earliest stages, the universal school merely attempted to teach everyone to read. A little later writing and the rudiments of arithmetic were taught, chiefly as vocational tools. Soon after the opening of the nineteenth century, however, new forces of social evolution began profoundly to influence the school. In Protestant countries, the strictly religious sanctions had favored universal literacy. But even here, toward the beginning of the nineteenth century, the religious sanctions were augmented and largely replaced by new needs which the rise of political democracy and the beginnings of the Industrial Revolution brought into being. These needs could not be met by literacy in the narrow sense of mere ability to read. They demanded an effort on the part of the schools to guide reading and to impart knowledge of a substantial sort. The universal school as the fundamental agency of mass-enlightenment had now a clear-cut mandate to broaden its program, and the introduction of geography was the first answer to this mandate. To put it in another way, one may say that the first significant effort of mass-education, once it had insured a modicum of literacy, was to lift the individual out of the narrow confines of his local habitat and give him a broader view of the world in which he lived. Even the crude geography that was taught in the common schools a century and a quarter ago did something to widen the space horizon of the common man. It was more than a generation after this before the need of widening the time horizon was clearly recognized by the introduction of history as a basic subject of common-school instruction.

I like to think of "liberal education" as meaning essentially the kind of education that acutally liberates—that frees the mind not only from the shackles of fraud and superstitution and error, but also from the foreshortened and distorted perspectives of the local and the immediate. In this sense, geography richly deserves its historic primacy among the liberalizing studies of the universal school. Nor do I believe that the fundamental educational function of geography has changed essentially during the century and a quarter of its development and expansion. From the point of view of mass-education geography today is just as much a primary and fundamental agency of universal enlightenment as it was at the outset. In addition to this inherent value, it has a pe-

culiar advantage over other school subjects in the relative concreteness of its materials and in the appeal that it makes even to immature minds.

THE POSSIBILITIES OF THE GENETIC APPROACH IN GEOGRAPHY

I am sure that large possibilities for education lie in these advantages—possibilities which extend far beyond the confines of geography itself and may make of it a most effective introduction to, and basis for, other liberalizing studies. In so far as I am aware, some of these possibilities have not as yet been thoroly explored in the work of the lower schools, and this is my chief reason for emphasizing them this evening.

In brief my thesis is this: The teaching of geography in the universal school has two large objectives: first, to get every member of each generation to know and understand as much geography as is possible in the time that is available; and secondly, along with this mastery of facts and principles, to develop in every member of each generation a keen appreciation of what this knowledge has cost and what it has meant to human progress. We shall have the best opportunity of achieving both of these ends, I believe, if in teaching the facts and principles, we give some attention to the way in which they have been discovered and established—if, in other words, we encourage the learner to see how the knowledge that we ask him to master has actually been made and what its making has actually accomplished.

I suggest this genetic study of geography for two reasons. In the first place, a most important function of mass-education is not only to make the human heritage of knowledge as far as possible a universal possession, but also to insure a keen and widespread appreciation of this heritage in terms of its cost and of its value—all to the end that the heritage may be sedulously conserved and enlarged. From certain points of view, indeed, this may well be thought of as the basic function of universal education in a democratic social order. Vastly more precious than our material heritage is our spiritual heritage—the heritage of facts, principles, standards and ideals, the heritage of science and art and literature. If the material products and symbols of modern civilization were to be destroyed the disaster would not be irretrievable provided that the knowledge, the standards, and the ideals which made them possible still remained. If the knowledge, the standards, and the

ideals were lost however, the disaster would be complete, for then even the products and symbols would soon become meaningless and useless. Now a spiritual heritage, as history abundantly proves, is a perishable thing. Missing a single link in the chain of its transmission from generation to generation may spell its doom. The only safeguard is to forge the links on as nearly a universal a scale as possible and this is what present-day mass-education tries to do. In doing this, however, the factor of appreciation is just as important as is the factor of understanding.

THE ADVANTAGES OF GEOGRAPHY IN ILLUSTRATING HOW KNOWLEDGE HAS BEEN MADE

The reason why I emphasize especially the study of geography from the point of view of appreciation is that this subject offers exceptional advantages for the genetic approach. How facts have been discovered, how truths have been established, and how progress has been affected by this knowledge can be much more concretely and much more appealingly exemplified in this field than in any other. These advantages constitute a factor of large significance in mass-education, for mass-education must do most of its work with immature minds, and to a very large extent, with minds which, whether mature or immature, can climb to the plane of abstract thinking only very slowly, and then only on the basis of many typical, concrete, and appealing cases.

It would be difficult, for example, for an immature mind or even an average mature mind to appreciate the efforts of historical scholarship to ferret out the truth from a mass of conflicting evidence; to evaluate and interpret musty records; to reconstruct with meticulous accuracy a series of events that transpired centuries ago. Minds of average ability can grasp the completed narrative, but how this narrative has been made available for them is usually beyond their interest and often beyond their comprehension. In varying degrees, the same is true of other fields of knowledge.

These limitations, however, are far less formidable in certain phases of geography than elsewhere, and this subject constitutes, therefore, the best field for fulfilling one of the most important functions of mass-education. The outstanding facts regarding the surface features of the globe, for example, were first learned by discoverers and explorers thru a series of adventurous experi-

ences that are among the most dramatic episodes of human history. In the aggregate these episodes constitute a magnificent epic, portraying one of the great key-movements of advancing civilization. From the point of view of education, the significance of this epic lies in the fact that it deals with events of outstanding importance and at the same time with events that make an elemental appeal and are otherwise well within the grasp of the average mind.

THE STORY OF EXPLORATION AND DISCOVERY IN THE TEACHING OF GEOGRAPHY

The program of the lower schools, of course, makes some reference to this epic. A few of the great explorers of the fifteenth and sixteenth centuries are stock characters in the elementary treatment of American history. The emphasis however, is historical rather than geographical. It is my opinion that the opportunities to enrich the learner's geographical knowledge thru reliving these great events are seldom utilized to the extent that they very well might be. Indeed, if one were inclined to raise the issue one might justly maintain that the achievements of many of the heroes of discovery and exploration belong to geography rather than to history in the narrower sense. This is certainly true of Marco Polo, of Prince Henry the Navigator, of Diaz, and of Da Gama. It is emphatically true of Magellan, that courageous and high-minded captain whose name in the brilliant annals of exploration still shines with the brightest lustre. It is true of Henry Hudson, of whom the world knows nothing except that he packed into seven short years a series of outstanding geographical achievements. It is true of Lewis and Clark, of Pike, and of Powell.

These and other characters have been appropriated by the textbooks in history when, as I have suggested, they properly belong to geography. These men devoted their lives primarily to expanding the boundaries of geographical knowledge. At least two of them lost their lives in the service of this ideal. To history in the narrower sense of the term their contributions were chiefly incidental and accidental. If they made history it was because they first made geography. Hudson, for example, incidentally established the claim of Holland to Manhattan Island and the contiguous territory, thus giving his name a place in political history. But in doing this Hudson was not seeking new territorial possessions

for Holland. Under the instruction of the Dutch East India Company he was seeking either a Northeast or a Northwest passage to the Pacific Ocean and the Far East. With intrepid courage he had tried the Northeast passage, but without success. A threat of mutiny among his sailors, wracked as they were by weeks of bucking the stubborn icepack, led him to turn to the West and to act on a hint that his friend, Captain John Smith, had given him, to the effect that a strait led thru the continent at about Latitude 40°. He found New York Harbor near this parallel and sailed up the river until he reached a point where the water was no longer salt. It was a river and not a strait that he had discovered. Smith's hint had been a false lead. But this did not discourage Hudson. It was all part of the day's work for an explorer. He returned to England, and the next year we find him again outward bound, still in quest of a Northwest passage. It was on this trip that his mutinous crew left him in an open boat to perish.

The few great heroes of discovery and exploration of whom mention is made in the school histories do not by any means comprise all of those with whom pupils might well become acquainted with very great profit to their knowledge of geography. The geographical conquest of Africa dates from the beginning of recorded history and continued over the centuries; yet so vast was the field and so overwhelming were the difficulties, that Africa remained literally the Dark Continent until well within the present generation. To reckon what our present knowledge of Africa has cost in terms of human effort and struggle and suffering is to gain a new sense of the subbornness of Nature in yielding up her facts. Along with the usual illustrations that one finds in the geography textbooks, depicting life in Africa, one might justly expect to find a few pictures of the explorers whose arduous and heroic labors have made the term, Dark Continent, obsolete. And in the "reference for further reading" there might be a list of the actual source materials available in the records written, often on the spot, by the explorers themselves.

The Annals of Exploration as Source Materials

This suggests another advantage of geography as a basic unit in liberal education. In most of the school subjects, the records of first-hand investigation are either unavailable or far beyond the grasp of the untrained mind. In the phase of geography that I

am discussing, many of the source-materials are not only written in simple language portraying very concrete experiences; they are also as fascinating as fiction,—some of them, indeed, equaling if not surpassing in human interest the finest products of imaginative literature. In reading them one vicariously participates in the work of discovery and exploration. I recall the surprised look of a college class when I announced, on the first meeting after a Christmas recess, that I had just returned from a trip to the Malay Archipelago. Of course they knew that I had not been there in person; and yet, as I told them, I had been there in a degree of reality that an actual personal visit might not even have approximated. I had spent a good part of the holiday season making the vicarious journey of exploration with no less a personage than Alfred Wallace, and under the guidance of this great naturalist I had seen vastly more than I could have seen alone and unaided on a personal visit,—and, what is more significant, I understood vastly better what he enabled me to see so clearly with my mind's eye.

In the same delightful vicarious fashion, I have lived with Wallace on the Amazon; with Captain Cook on his great voyages of discovery in the South Pacific; with Nordenskiöld when he negotiated the Northeast Passage; with the long list of heroes who strove so valiantly to find a Northwest Passage; with De Long and Greely and Nansen and Peary, with Amundsen and Scott, in the Polar regions, North and South; with Livingstone and Stanley in Africa; with Alexander Mackenzie in Canada; and with others too numerous to mention.

I refer to these vicarious travels, partly because they have been among the keenest pleasures of my life, but chiefly because I can accurately locate the source of my interest in the literature of discovery and exploration. It came more than forty years ago from two teachers in the upper grades of the elementary school. These teachers saw the possibilities of making the study of geography a series of real adventures, and acting upon this insight they introduced us to these fascinating first-hand records of the way in which at least some segments of geographical knowledge had been made.

Vicarious Adventure on the Higher Levels

The element of adventure in learning is not confined, however, to the vicarious surmounting of physical obstacles and the vicari-

ous conquest of physical dangers, which the rich literature of discovery and exploration makes possible. A quite analogous attitude may be taken with reference to the more advanced types and problems of learning, and one advantage of the procedure that I have suggested is that it provides a basis from which the transition from the plane of physical adventure to the plane of intellectual adventure can readily be made.

On this higher plane, too, geography offers unusual opportunities. The more abstract conceptions and principles which the mastery of geography involves have had, in their turn, a fascinating history. I suppose that the greatest of geographical discoveries was that which proved the earth to be a sphere. Here we have also, perhaps, the clearest example of a great truth established by intellectual processes long before it was demonstrated in a physical sense. What a stupendous achievement was the clear-cut reasoning of Aristotle in assembling those convincing proofs that the earth could be nothing else than a sphere!

Nor should the brilliant work of the Roman and especially the Arabic scholars be forgotten. It enhances one's respect for the Arabs to know that their scholars, long before the days of Columbus and Magellan, computed the length of a degree of latitude with a remarkable approach to accuracy and deduced therefrom the approximate size of the earth. What we used to call mathematical geography truly has its marvels, at least some of which the competent teacher can make clear to average minds. I know, because an early teacher of mine worked the miracle on one mind that, so far as mathematical acumen is concerned, is certainly not above the average. It was, if I remember aright, in the fourth grade that we studied the proofs of the earth's sphericity, and I can recall distinctly the thrill that came when I first grasped the truth that only a ball-shaped body can cast a circular shadow whatever side be toward the light. I did not know then that I was following thru a chain of reasoning the links of which were first forged by the keenest intellect that the human race has produced,—in so far at least as the records reveal,—and I did not stop to thank Aristotle for the thrill that he had given me. And so it is with many of the lessons that we learn. We may grasp them and use them quite oblivious to the original travail which brought them into being. And quite without recognition of,

still less gratitude to, the giants upon whose shoulders we are permitted to stand.

A Few Disclaimers in Conclusion

And so I come back to my fundamental thesis; namely, that a truly liberal education, on whatever level it may work, whether elementary, secondary, or higher, should have as one of its prime objectives the development not only of understanding but also of appreciation. I do not mean in any sense to encourage a sentimental attitude toward the problems of teaching and learning; nor do I wish to belittle the significance to education of hard work and systematic effort nor the need of drill, repetition, review, and other processes from which present-day pedagogy is inclined to shrink. The teachers who made the study of geography to me a series of adventures did not accomplish this end by sugar-coating the process. There was nothing flabby or mushy about their methods. There was much in those days that we were required to master verbatim; innumerable associations of names and places and locations and boundaries that were made automatic by relenting drill. Personally I do not at all regret that educational theory and practice, when I went to school, had a vigorous backbone and blood that was strongly tinctured with iron. In some way or another, however, these teachers succeeded in reading into the process meaning and significance and to me a goodly measure of fascination. Hard work was taken for granted; and under such a condition, I am sure, one is justified in applying the doctrine of interest to the limit.

Nor, in my suggestion that teachers of geography capitalize in their teaching the rich materials in the history of their subject, do I wish to become embroiled in the controversy that is raging over the proposed union of geography and history as educational disciplines. There are controversies enough in my own special field to satisfy my fighting instincts and to keep me from seeking new trouble elsewhere. Whether geography is essentially a social science or essentially a natural science is a question in the settlement of which I prefer to remain an innocent bystander. But even if we assume that geography is essentially a natural science, I can see no good reason why the teacher of geography should surrender his rights to the historical facts of his own field. Teachers of other natural sciences find no call for such a sacrifice. Indeed, if

we grant that the genetic approach to any field of knowledge has large pedagogical advantages, it is reasonable to assume that the persons best qualified to exploit these advantages are the teachers in the special fields rather than the teachers of history.

Finally, in emphasizing the importance of learning something about the way in which knowledge has been made, I should wish to disclaim anything but the highest praise for those teachers who inspire their pupils and students to find things out for themselves thru independent observation and experiment. In fact, I know of no better way to encourage independent observation and experiment than to live vicariously for a little while with some of the masters who have practiced these difficult arts most successfully. One can live, for example, with Tyndall while he measures the movements of a great glacier and demonstrates the virtual identity of the principles that govern flowing rivers, whether rivers of water or rivers of ice. One can work with Darwin as step by step he discovers the part that earthworms play in the formation of vegetable mould. One can work with Mackenzie as he studies the habits and customs of Indians on the Canadian plains. I mention these men particularly because their records are veritable masterpieces of simplicity, directness, and clarity,—so simple, so direct and so clear that even the untrained mind gains from them an illusion of reality almost equivalent to actual experience.

May I record my conviction that the first-hand records of your field, at least in the small measure in which I have become familiar with them, furnish the very best exemplifications of the spirit and methods of scientific inquiry that can be grasped and appreciated by average minds? Perhaps even beyond this is the fact that the men who made these records are men whom it is good to know in the very intimate fashion that a study of their records makes possible. From Aristotle to Amundsen, they have been giants not only of intellect, but, in almost every case, of character as well. I doubt whether any other field of human endeavor can produce a list of leaders so upstanding and so outstanding. To introduce the young people of each generation to these men and let them live with them and work with them a little while, would be, I should think, a priceless privilege of the teacher of geography.

FARMERS AND FARMING IN CAMBRIDGESHIRE

ELLA M. WILSON
Normal College, Ypsilanti, Michigan

GENERAL CONDITIONS

Cambridgeshire is one of the most important farming districts in England with thirty-eight out of every hundred workers engaged in agriculture when the average in England is seven out of every hundred. The agriculture there is varied for it has both down and fen. The downs, the low rolling uplands which look like green waves in the early spring, are in the southern part of the county; the marshland or fen is in the northern part.

It is more difficult to visit English farms than it is American farms for an Englishman's home is his castle and strangers are not supposed to intrude beyond the wall or hedge which encloses the farm. When, however, the farmers understand what visitors want, every courtesy is extended.

A DOWN FARM

On the billowy down, was Dungate Farm comprising almost a thousand acres. The fields were large with hedgerows in between. There was a wood, too, a game preserve; an unusual feature of the landscape on either down or fen. The farmer didn't care for it himself. He had high rents to pay and the wood land would be more profitable to him in crops especially since he could not cut any of the trees or shoot any of the game without the landlord's consent.

For there was a landlord, a London lawyer who came down every two weeks or so for a few days. He didn't live on the farm. He was the capitalist who supplied the farm and the buildings and hired the farmer. The farmer, in turn, hired laborers living in a hamlet near to work the farm. This "farmer's" work was more like that of a manager on a large estate in the United States and his social position was as sharply defined as that of the old-time overseer on a southern plantation. Neither owner nor farm manager nor agricultural laborer was like the American farmer for one owned the farm but did not work it; one managed the farm but neither owned nor worked it; and one helped work the farm and had no interest in it but his daily wage.

THE COUNTY COUNCIL FARMS

Most of the land in Cambridgeshire is owned by the Crown, the Church, the gentry, the Colleges, or the County Council. The farms most like our own are those managed by the County Council.

The County Councils of England went into the business of farming to try to relieve the farm depression of the latter part of the nineteenth century. English farmers like Danish farmers suffered when large quantities of American wheat reached the English markets. The wheat growers of the eastern counties, of course, suffered most. Various measures were suggested for their relief, among them the Small Holdings Act of 1892. This act allowed the County Councils to purchase land in the open market. They must sell it in plots not exceeding fifteen acres in size. This law functioned very little because it was permissive rather than compulsory. The Act of 1908 was effective and is the basis for the present activities of the County Councils. It compels landowners to sell to the Councils for a fair price if the Councils have a demand for the land. As a rule, the land is divided into small holdings and is rented on terms profitable to both parties. In the first seven years under this Act, 200,000 acres were acquired and some 126,000 small holdings were set up in England.

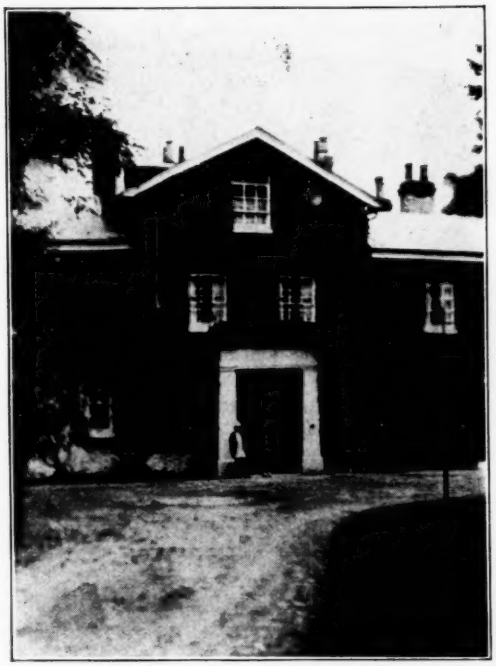


FIG. 1. London business pays for Dungate farm house. Photo by author.

The success of the Act is due in part to the fact that the small holder has learned to produce milk, poultry, fruit and eggs at a profit providing there is a market near. Consequently in counties like Cambridgeshire with easy access to the London market there has been the greatest increase in small holdings. By August, 1925, its County Council had purchased 17,379 acres for $2,700,000

and leased 1,999 acres at $14,000 a year, a total of 19,378 acres.

Before 1914, the rent paid was equivalent to 3½ percent of the value of the investment plus a small sum more to cover losses, and the cost of operating the system. Since the war the rate has been raised to 5½ percent. Practically all of the pre-war schemes are solvent. The "holders" are supervised in a large way to see that they are maintaining the fertility of the land. If a renter wishes to leave he must give notice and the land is either brought up to its original fertility before he leaves or he must pay money enough to bring it up.

FIG. 2. Little space is needed for housing stock or crop on Dungate farm. Photo by author.

THE FEN

Much of the land is on the fens—that lowland around the Wash which averages only fifteen feet above sea level. Before 1653 it was a water-logged and often a water-covered waste with here and there a bit of higher and drier land in the "sea of meres" upon which the first settlements were made.

Under the leadership of the Dukes of Bedford it was drained and reclaimed according to plans made by a Dutch engineer, Vermuyden. Small ditches guarded by sluice doors emptied into the main ditches. After twenty years, the peat of the reclaimed land shrank so much that the side drains no longer discharged into the main drains and windmills and later steam pumps were erected to lift the water to the higher levels.

SMALL HOLDINGS ON THE FEN

This "Golden Plain of England—the Great Fen" is "let" in a variety of ways—some in "colonies," some to "associations" but most of it to individuals. Holdings of the last class seemed most like our farms and a number of them were visited.

On Soham Mere[1] was a plot of 1,568 acres rented to sixty-two

[1] Called "mere." Name persists after area is drained.

men. The land was as flat as a floor. Willow-lined ditches crossed it at intervals and a steam pumping station lifted the water from the ditches into Soham Lode just to the northeast. The tilled land was well drained but the roads were as bottomless as our side roads in wet weather.

Fourteen families lived in the seven houses on the land, the rest lived in Soham village. Two of the men living here ran the pumping station. The houses were new and "modern"—each had water piped to the kitchen sink! A most unusual thing in rural England.

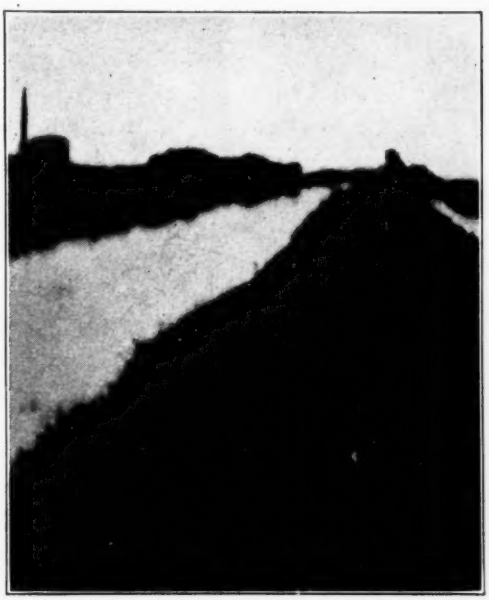


FIG. 3. A power house. Fenlands must have pumping for drainage. Photo by author.

In the farm yard were several small open sheds for storing tools and two barns without lofts. All hay was kept outside, each stack protected by its own thatched roof. The barn floors were of cement and the walls were of wood coated with tar which wears longer than paint in that climate. All the farm machines were of English make except the binder. That was a McCormick.

The man visited cultivated 22½ acres. His rent was $15 for the land near the road and $6 an acre for the cheapest. He owned 2 horses, 30 pigs and 80 chickens. He averaged 200 eggs a week. All the holdings carried with them "common rights" in a pasture of fifty acres. One animal over eighteen months old, was allowed for each 10½ acres, or two animals under eighteen months. He had three animals on the pasture—cows, I judged.

At this time (1925) he had 7 acres of wheat, 3½ acres of barley, 4 acres of oats, 2 acres of "horse beans," 4 acres of potatoes, and 1 acre of mangels. His potatoes were his money crop, and he sold them to a dealer who sent them to the London market. He sold also either his wheat or his barley depending upon which was bringing the better price. He fed what he had left to his stock. He

had no fruit, no garden, and no woodland. The willows furnished wood for fuel when just a small fire was needed and for hurdles which were sold to sheep raisers on the downs.

FIG. 4. Wheat fields are among the sedges of Wicken Fen. Courtesy of H. Yule Oldham.

His yields were high. Wheat had averaged 48 bushels to the acre for a number of years and one year the yield was 72 bushels to the acre. Potatoes averaged 8 tons to the acre—about 260 bushels. He bought two tons of phosphate in a year but depended mainly upon his stock to keep up the fertility of the soil.

Each of the sixty men on Soham Mere worked his holding as an independent unit except in harvest time when all combined in renting a threshing machine and in threshing the grain.

The most attractive aspect of these holdings was the well-tilled land itself. The houses, substantial and new, but ugly; the yard, unadorned; and the monotonous fen lacked all the features of an American farm home. The "farmer" was part of his background, unlettered, uncouth in speech —but practical withal. He was content for he had graduated from the class of agricultural laborer into that of the small holder.

FIG. 5. The vegetables and small fruits grown till the orchard is in bearing will be shipped in the crates stored in this small shed. Photo by author.

A FEN FARM

Of all the farms visited, that of Mr. Branch of Waterbeach seemed most nearly like our own. He had rented the same forty-

three acres for eleven years. Altho his fields were small—there were some wire fences as well as hedgerows—he used machines for all his work. He had a McCormick binder, too, because he liked it better than the English machines. In using it he went once around the field with the scythe before he started cutting. He could not afford to have the binder waste that swath with wheat yielding all the way from 48 bushels to 60 bushels an acre. He rotated his crops carefully. Some of the farmers near him were raising sugar beets but he preferred the usual fen crops. He kept cows, chickens and bees and had a garden and an orchard.

FIG. 6. Farm laborers live in villages like this. Photo by author.

The milk of his six cows was sold at wholesale for 32 cents a gallon on the farm. This was more profitable than butter making for he could not compete in price with New Zealand and Danish butter. The money from the milk ran the house and paid for the labor. The wheat money paid the rent.

Mr. Branch was paying a rent of $9 an acre for his land and $90 a year for his buildings which consisted of an old brick house and a half dozen shed-like barns.

Then came the familiar plaint, "Labor is dear and not very good. I have to pay my man 31 shillings a week and a 12£ bonus at harvest time. His day is eight hours and he must be paid extra for overtime. Oh, no, he doesn't live here. He rents a cottage at Waterbeach for a shilling or two a week and a garden comes with his cottage. It's easy to keep a man busy all the year. Last winter we ploughed every week but two. There's little frost in the ground."

He was making money not only because he used good farm

practises but because he paid attention to the business of buying as well. He belonged to a cooperative society that had a hundred members. They bought all their supplies at wholesale and even owned their own threshing machine. None of the members sold thru the society. They didn't *want* the society to sell the crops; each preferred his own judgment in that.

Owning a farm didn't interest him at all. He had some boys growing up who would want a farm some day. By putting his money into machinery and cows, he could avoid death duties (inheritance tax) and at the same time provide an inheritance for his

FIG. 7. This vegetable and flower garden was back of the second white house in Figure 6. The many small buildings were for the cow, the chickens, and the tools. Photo by author.

children which could be divided among them easily. He expected them to be what he was himself.

SUMMARY

From such a casual investigation it is much easier to tell what farming in Cambridgeshire is like than to describe the farmers. While in general there are two types of farms—large on the down and small on the fens—the crops overlap. This is especially true of wheat which is raised both on down and fen. On the other hand barley, beans and sheep are characteristic upland crops for they do well enough on thin soil. Potatoes, oats, small fruits, cattle and pigs are grown much more extensively on the lowlands.

Climatic and soil conditions in Cambridgeshire favor grain production to such an extent that it can be raised at a profit in competition with cheap foreign grain. As a result, it has continued to be important as a milling center. Modern steam mills, small as a rule, have replaced most of the old wind mills which used to be as marked a feature of this landscape as in its neighboring "nether land" across the sea.

The high average yields of all crops and many small well cultivated fields indicates a more intensive cultivation than is general in America. Weeds even in corners are uncommon. It is a machine cultivation, however, horse-drawn machines, usually, especially on the fens, with some tractors on the downs.

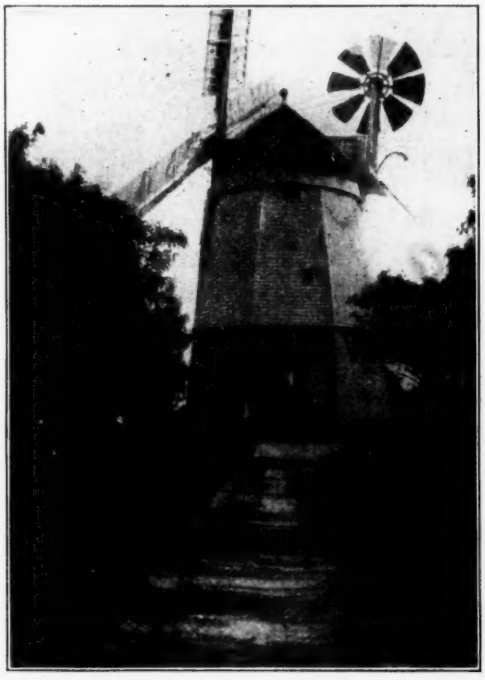


FIG. 8. The Tower Mill, Fulbourn, has ground the barley of the downs these two hundred years. Courtesy of Cherryhinton Granaries, Ld.

To an American, farm wages seem a pittance and laborer's cottages either old, picturesque, unsanitary and lacking in comforts; or else, new, ugly, sanitary, and still lacking in comforts. To the continental English wages seem high and the houses comfortable. A geographer of Czechoslovakia said to the writer, "The cottages here (England) are warm in winter with the plentiful supply of coals. At home that would be uncommon." The English farm laborer, himself, is dissatisfied for he knows that he gets much less than the English factory worker, the railroad worker, or the shopkeeper's assistant. The fact that he is less crowded in his housing does not compensate him, he thinks, for his lower wage.

The greatest benefit of small holdings is social rather than economic. They give the ambitious agricultural laborer a chance for "advancement." For this social betterment, he is willing to

work long hours with small financial return. If he is prosperous, it is largely thru the production of milk, meat and luxury crops. In preparing these, he turns his raw materials into semifinished manufactures and so gets a greater remuneration for his labor than in the sale of wheat or potatoes. His living conditions are not good. Improvement will come by increasing the size of the farms, by decreasing the number of laborers thru the use of machinery, and by increasing the laborer's efficiency and his wage thru scientific rural education.

THE GEOGRAPHIC REGIONS OF INDIA*

D. R. BERGSMARK
University of Cincinnati

India is a large country and a country of contrasts—contrasts not only in environment but in human activities as well. Religion and caste, poverty and magnificence, are four words that bespeak India. Confusion of tongues and races, of government and customs, might be added. Extremes of almost everything are another possession—from the low, humid plains of recent alluvium along the Lower Ganges to the crystal air of the Himalayas of Kashmir.

In general contrasts in human adjustments are due to two important factors: first, the different population groups that have settled in various portions of the country, forming diverse social and economic groups; second, to the varied environment of the country making various regions in each of which human adjustments are uniform. Thus as a result of the difference in the relationship which exists between the natural environment and human activities in the various sections of India, a number of regions may be recognized.

The country may be divided into regions in various ways. If we were studying climate the map would show the different climatic regions. If we were studying physiography the maps would show the different physiographic regions. But we are here interested in India as the home of man, or the relation between human activities and environmental conditions, or "the human adjustments to environmental conditions in the various portions of the country." Thus the environmental as well as human use differences should

* Much of this material was worked out in connection with W. D. Jones' course on Asia at the University of Chicago.

be taken into account in subdividing India into geographical regions. For example, rice is the major crop in the Lower Ganges Rice and Jute Region as well as in the area of the Western Ghats. But what a difference in their environments!

Units smaller than regions may be recognized. These are called provinces. They are areas within the regions that show differences in their environmental adjustments; yet they do not differ sufficiently to form distinct regions.

THE LOWER GANGES RICE AND JUTE REGION

In the lower portion of the Ganges and Brahmaputra river valleys, embracing most of Bengal, is an extensive area of recent alluvium, well watered during the summer monsoon and for the most part very fertile and productive of abundant crop yields.

In this Lower Ganges Rice and Jute Region the rain falls chiefly during the summer monsoon, at the time of greatest heat, and plant growth.[1] In fact, records taken at Calcutta show that about 60 per cent of the total rainfall is received during the three summer months of June, July, and August (Fig. 2). But this region has low relief; so low in fact that water covers vast stretches of land during a large part of the winter half-year. Here temperatures never reach the freezing point during the winter, hence crop production is possible thruout the year.

Agriculture is the dominant activity and the chief source of wealth. In fact, about 75 per cent of the people of India are engaged in that pursuit. The agricultural population here is very dense, estimated at about 550 to the square mile. Much food is needed for such a dense population. This large demand is met by intensive cultivation, and the production of crops that will yield much food per acre.

Here rice is vastly important. Three varieties of rice are grown, depending upon the depth to which the valley is flooded. The major part of the rice crop is consumed by the dense population.

Jute is the other crop of importance in this region. Altho jute may be grown in many tropical places, its cultivation is confined almost exclusively to the eastern portion of this region, especially that portion east of the Brahmaputra, where we find the most im-

[1] W. G. Kendrew, *The Climates of the Continents*, p. 111. Oxford University Press, New York. 1922.

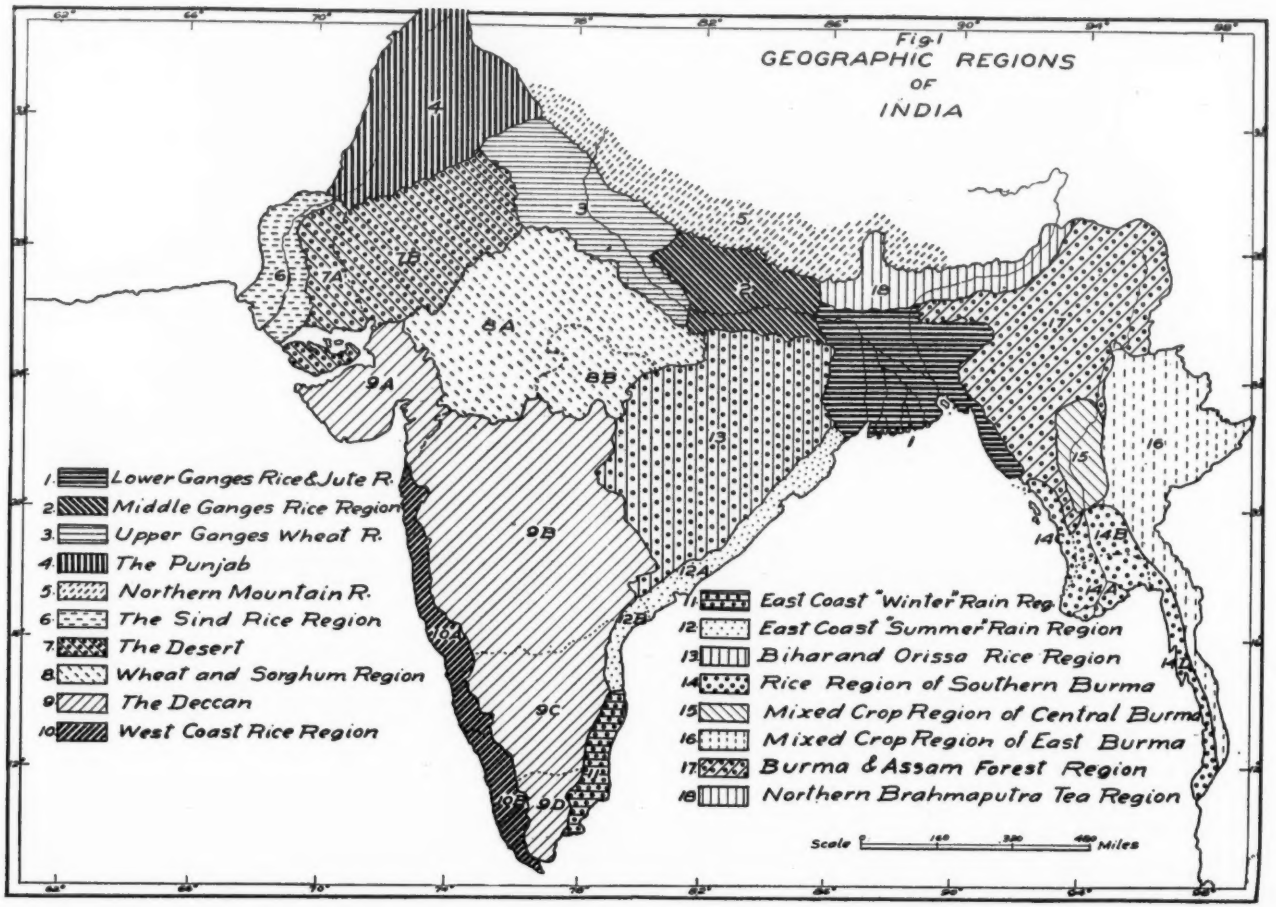


Fig I
GEOGRAPHIC REGIONS
OF
INDIA
1. Lower Ganges Rice & Jute R.
2. Middle Ganges Rice Region
3. Upper Ganges Wheat R.
4. The Punjab
5. Northern Mountain R.
6. The Sind Rice Region
7. The Desert
8. Wheat and Sorghum Region
9. The Deccan
10. West Coast Rice Region
11. East Coast "Winter" Rain Reg.
12. East Coast "Summer" Rain Region
13. Bihar and Orissa Rice Region
14. Rice Region of Southern Burma
15. Mixed Crop Region of Central Burma
16. Mixed Crop Region of East Burma
17. Burma & Assam Forest Region
18. Northern Brahmaputra Tea Region
Scale
Miles

portant jute-producing area of the world. Here more than ten million bales of jute are produced annually on about three and one-half million acres of land. Have you ever wondered why jute-production should be thus concentrated?

The successful cultivation of the crop in this place is due to a combination of factors, such as good soil; an abundance of rain; plenty of good water for retting purposes; and cheap labor. Moreover, this area is especially favored with early rains, and the jute plant grows four to five feet before the beginning of June and July, when the summer monsoon is reaching its period of full development.

THE MIDDLE GANGES RICE REGION

The Lower Ganges Rice and Jute Region has a neighbor and close relative on the west—the Middle Ganges Rice Region. Like the Lower Ganges Rice and Jute Region it has rice, alluvial soils, abundant rainfall; nevertheless there are differences. In this region jute is relatively unimportant and staple crops other than rice have a prominent place in the cropping system.

The relief of the Middle Ganges Rice Region is greater, and its altitude is higher than that of its neighbor farther down stream. Thus the drainage is better, and the soils are less waterlogged. Drier soil means a possibility for a greater variety of crops. But in both regions alluvial soils are the predominant type, and both areas are drained by the Ganges River and its tributaries.

In this region some irrigation is practiced. But irrigation water merely supplements the normal rainfall, since the latter is almost sufficient for maximum crop yields. Relief, rainfall, and kinds of crops combine to determine the irrigation system. Altho this region is higher above sea level than the Lower Ganges Rice and Jute Region, the ground water level is near the surface over most of the area. Moreover the rainfall is so abundant that irrigation waters are needed only to supplement it. Wells have been found satisfactory for that purpose.

Rice is the chief crop for food; but other crops are grown also. For example, this region is an important producer of flax seed, of sugar cane, of corn, and of barley. Moreover, wheat production begins in the lower portion of this region and it increases in importance up the Ganges Valley. The rice and corn are summer (kharif) crops, whereas barley, wheat, and flax seed are produced

during the winter season. On the other hand, sugar cane is frequently in the process of growth for more than twelve months.

The Upper Ganges Wheat Region

This area differs considerably from the regions previously discussed in (1) the relative importance of rabi (winter) crops, (2) in the greater variety of crops, and (3) in the fact that bajra and jowar (grain sorghums) displace rice to a considerable extent as the chief crops during the summer season.

In contrast with the Middle Ganges Rice Region, canal irrigation rather than well irrigation is practiced. Well irrigation is not as important, since in this region the water table is deeper. Moreover the rainfall is more unreliable both as to amount and time of occurrence. Wells merely supplement the rainfall in the Middle Ganges Rice Region, whereas this region must depend almost entirely upon an artificial water supply, which is best secured by means of canals.

The Punjab

The Punjab has a total area of ninety-seven million acres, of which twenty-seven million are cropped. An additional eighteen million acres are arable waste or fallow, and seventeen million non-arable waste, such as stony ground, river beds, etc.[2] The province of the Punjab accounts for about one-third of the total wheat area of the country. Production of wheat for the year 1926 reached 353[3] million bushels in all of India and 128 million in the Punjab.

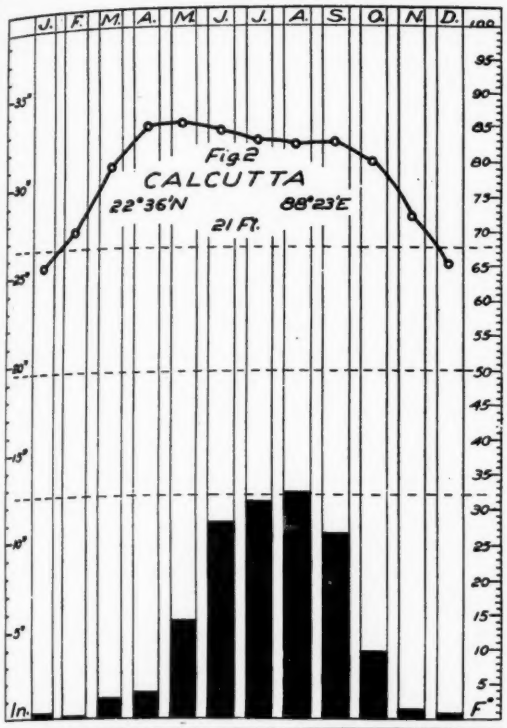
The last thirty years have been years of outstanding progress in the Punjab. New canals have been dug, new railways have been built, new towns have been founded. The arid plains between the five rivers (Indus, Chenab, Jhelam, Ravi, and Jutlej) have been converted into one of the granaries of the world.[4]

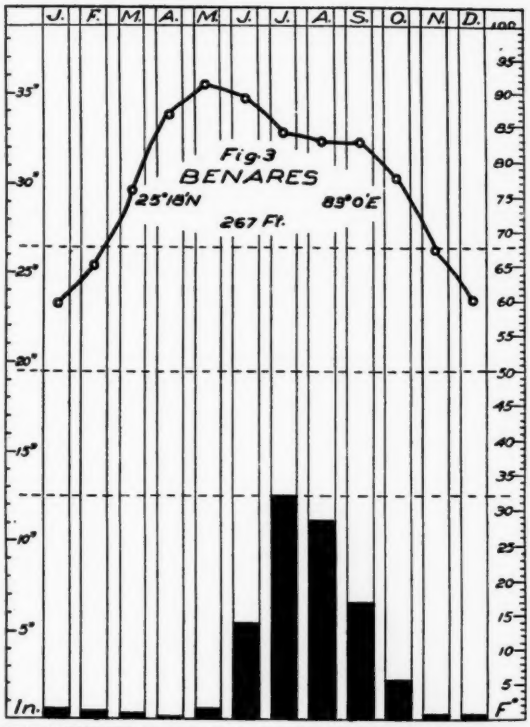
In this portion of India one finds a religious community of people called the Sikhs. These people are very numerous in some districts, but they do not occupy a territory capable of being demarcated. They live intermixed with Hindus and Mohammedans. They constitute about one-eighth of the population of the Punjab,

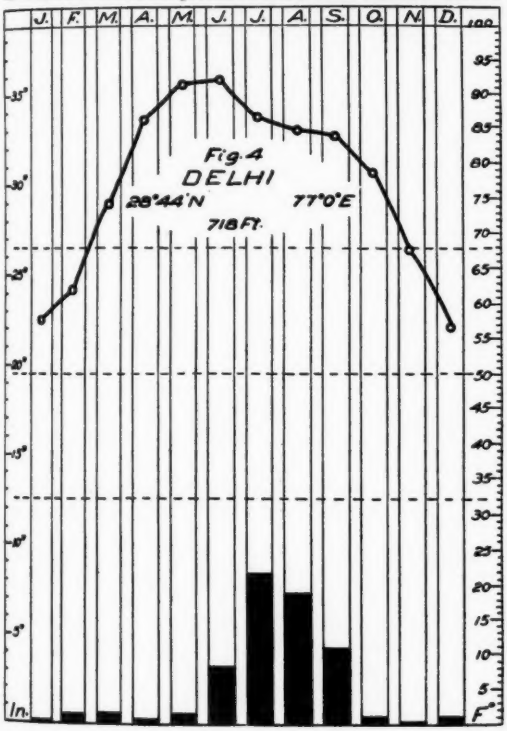
[2] Foreign Crops and Markets, June 18, 1928, p. 925. Washington, D.C.

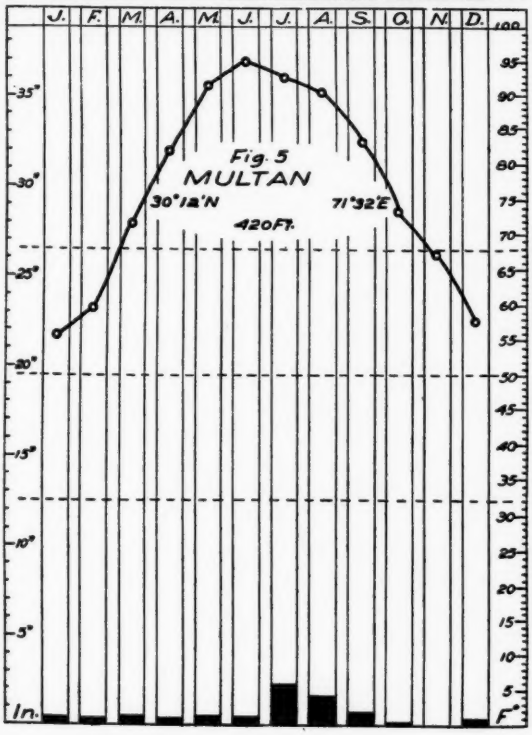
[3] Agriculture Yearbook, pp. 808-810. Washington, D.C. 1926.

[4] Komma, "The Sikh Situation in the Punjab," *Fortnightly Review*, vol. 119, pp. 238-251.


J. F. M. A. M. J. J. A. S. O. N. D.
Fig.2
CALCUTTA
22°36'N 88°23'E
21 Ft.
In.
F°


J. F. M. A. M. J. J. A. S. O. N. D.
Fig.3
BENARES
25°18'N 83°0'E
267 Ft.
In.
F°


J. F. M. A. M. J. J. A. S. O. N. D.
Fig.4
DELHI
28°44'N 77°0'E
718 Ft.
In.
F°


J. F. M. A. M. J. J. A. S. O. N. D.
Fig.5
MULTAN
30°12'N 71°32'E
420 Ft.
In.
F°

regarded as a geographic unit. Sikhs serve in large numbers in the British Indian army. During the Great War one in fourteen of the Sikh population in the Punjab served in it; a proportion ten times greater than that contributed by the population of India as a whole. The Sikh has been more or less a thorn in the side of the British, especially during the post war period of adjustment, when prices of grain were low. Violent crime and demonstrations were common in 1921 and 1922. At present, however, there is more content because of the better economic conditions that prevail.[5]

THE NORTHERN MOUNTAIN-HEALTH REGION

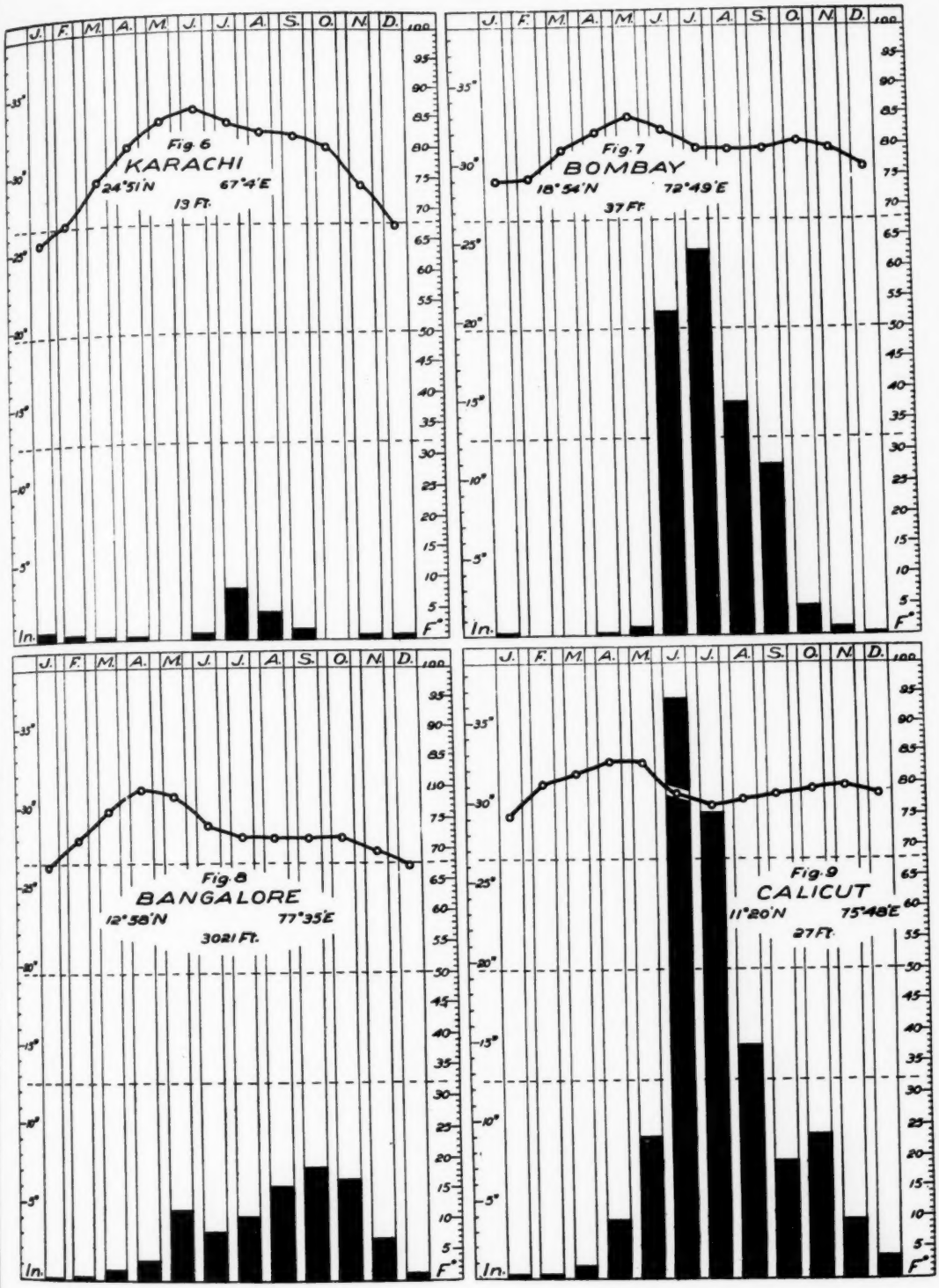
The Northern Mountain Region (5) embraces the high Himalayas and their foothills. Here we find the highest mountains of the world and some of the world's most rugged relief; hence here we may expect to find every conceivable climate and every variety of vegetation, from the tropical growths of the low-lying valleys where the heat is at all times great, to the scanty, snow-bound vegetation of the upper slopes of the Himalayas, on the high peaks of which vegetative growth ceases entirely.

Human activities here are also varied. Certain portions of these mountains offer the finest hunting grounds of the world. Large trees, especially teak and sal are found along the lower valleys. Upland rice is produced in small patches on the slopes. But above all this mountainous region serves as a place of refuge from the intense heat and enervating conditions of the Gangetic Plains to the south. Hill stations have been established to which people and government move during the most oppressive times of the year.

T. H. Holdich gives a good account of the importance of the mountains to the welfare of the average European who dwells in the northern portion of India:

". . . . these Himalayan hill-stations, centers of European life and interest, exercise a most important function in the gradual process of social development. But for them the conditions of modern European life in India would be almost intolerable. It is the increasing facility with which the overworked official, with damaged health and tired brain, enervated by daily official rou-

[5] J. Maynard, "The Sikh Problem in the Punjab," *Contemporary Review*, vol. 124, pp. 292-303.


J. F. M. A. M. J. J. A. S. O. N. D.
Fig. 6
KARACHI
24°51'N 67°4'E
13 Ft.
Fig. 7
BOMBAY
18°54'N 72°49'E
37 Ft.
Fig. 8
BANGALORE
12°58'N 77°35'E
3021 Ft.
Fig. 9
CALICUT
11°20'N 75°48'E
27 Ft.
In.
F°

tine in the stifling atmosphere of the civil law courts, or worn out by those bodily derangements which are inseparable from the experience of duties performed in the heat of an Indian summer, can speed to the hills and recoup his strength in a pure atmosphere and a comparative cool climate, that keeps the great machinery of government in working order. . . . . But for the hill stations of India an Indian career would imply a continuous series of rapid journeys from India to Europe and back again."[6]

THE SIND RICE REGION

In contrast to the Punjab, this is a region in which inundation irrigation rather than perennial diversion irrigation is practiced. Here rice is the principal crop, especially in the low lands adjacent to the canals. This rice is produced under desert conditions (Fig. 6). Irrigation alone makes rice production possible. The irrigation waters, however, are not sufficiently under control for crops such as corn and cotton. To prevent the possible failure of kharif and rabi crops because of an insufficient water supply, well irrigation supplements the inundation practice over large parts of the area. In the southwest portion of the Sind, there is much land unsuited to agriculture, consequently less than 10 per cent of this portion is crops. The Sind differs from most of the preceding regions in having a sparse population—merely seventy people per square mile.

THE DESERT

This region is characterized by extreme drought. The people are nomadic. They move about from place to place, establishing themselves as long as the water supply in the wells is sufficient. The population is exceedingly sparse, and the chief means of subsistence is grazing. Formerly the inhabitants of this region sought their livelihood by plundering their richer neighbors. Two provinces may be recognized: province 7B in which little or no irrigation takes place; and, province 6A, in which some irrigation is practiced on the relatively few acres devoted to crops.

CENTRAL WHEAT AND SORGHUM REGION

As the name suggests, this is a region in which wheat, jowar, and bajra (grain sorghum) are the chief crops. This region dif-

[6] T. H. Holdich, India, p. 125. Appleton and Company, New York. 1905.

fers from the wheat regions of the Punjab and Upper Ganges in topography, amount and dependability of rainfall, irrigation practices, and the proportion of total area which is under crops. Two provinces are recognized on the basis of the predominance of a certain crop. In 8A jowar and bajra occupy a larger percentage of the cropped area than in 8B, where wheat is the principal crop.

THE DECCAN

This is far and away the largest geographic region in India. Four provinces may be recognized:

Province 9A is a low, level stretch of land; the low altitude of which enables the monsoon winds to sweep over it without losing much of their moisture. Jowar and bajra are the principal crops. Hardy varieties of cotton show favorable returns in years of sufficient rainfall.

Province 9B embraces Berar and Hyderabad, in which about 35 per cent of the cotton of India is produced. Jowar and bajra are the principal crops for the province as a whole. The black soils within this province are especially suitable for maximum crop yields.[7]

In contrast with the rice growing regions, where rainfall is abundant, the irrigated regions, where the moisture supply is controlled, and the desert, where the population is sparse, this region is one in which famines occur frequently. Rainfall is scant and unreliable, and a slight deficiency may cause a very severe famine.

The Ragi Province (9C) is one characterized by a small amount of rainfall, which is erratic in character; relatively poor soil; tank system of irrigation; a large percentage of uncultivated land due to sterility of the soil; and ragi, one of the grain sorghums, as the chief crop. Ragi grows better than jowar or bajra on a soil which is slightly sterile. It also keeps well, but it is not considered as palatable as the other grain sorghums.

The Southern Diversified Farming Province (9D). Altho jowar and bajra are the chief crops; nevertheless here a greater variety of crops is grown than in the provinces to the north. This province feels the influence of the North East Monsoon during the

[7] These soils have been derived from the basic Deccan trap, formed from lava flows in the remote geologic past. This area has its counterpart in the Columbia Plateau of the United States.

"winter" months, as well as during the opposite half-year, causing a more uniform distribution of rainfall. Cotton, tea, and rice are other important crops in the system of agriculture in this province.

THE WEST COAST RICE REGION

This is an area of rough topography, where owing to the character of the relief, a relatively small proportion of the area is under crops. Much of the uncropped land is in forests. Here the rainfall is abundant (Fig. 9), and in general irrigation is not necessary. Rice is the dominant crop, and as many as three crops are produced in a year. This is a region in which coconuts, spice, tea, and coffee are important secondary crops; and some rubber is produced in the southern portion.

Two provinces may be recognized. Province 10B feels the effects of the North East Monsoon to a certain extent. In this province about 20 to 40 per cent of the net cropped area is under tea. Moreover a larger proportion of the net cropped area is under grain sorghums than in the province to the north (10A).

THE EAST COAST REGION OF "WINTER" RAIN

In contrast with the west coast, this region has 25 to 50 inches of rain annually, whereas the west coast gets about 100 inches. On the west coast the land is flooded naturally, whereas on the east coast irrigation is practiced. The west coast is more hilly and highly dissected; the east coast is rather rolling, with occasional hills. Rice is the leading crop in both regions, but the secondary crops differ. Coconuts, peppers, tea, coffee, and rubber are grown in the former; whereas the jowar, bajra and ragi are produced in the latter.

THE EAST COAST REGION OF "SUMMER" RAIN

As the name indicates this region differs most from the region to the south in the fact that rains occur during the "summer" months. Two provinces are recognized in this region. Both provinces have agricultural practices that are very much alike; in both places irrigation is practiced by means of throwing weirs or dams across the river channels. But the one differs from the other in that a greater percentage of the cropped area is under rice in 12A than in 12B.

THE BIHAR AND ORISSA RICE REGION

Here we have a more abundant rainfall than in the Deccan, a system of tank and well irrigation, and rice as the dominant crop. Flax is a crop of great importance in the western portion of this region. Other secondary crops of importance are lac and the grain sorghums. Some coal and iron is produced within this region. The population is relatively sparse for India. Most of the people live in the lowland.

THE RICE REGION OF BURMA

Rice is here the chief crop, and three crops are frequently produced in a given year. Sesamum, beans, and rubber are important secondary crops. The population is sparce and rice consequently becomes important in the export list.

Four provinces are recognized within this region: Province 14A is a fertile, relatively flat piece of land, which is flooded annually. Moreover, it has a low latitude wet and dry type of climate (ranier phase). This combination of factors makes the area especially suitable for rice.

The province to the north (14B) is an area of older, and better drained alluvial plain. Flooding, however, is general on the lands along the streams.

Provinces 14C and 14D are very similar in topography, and quite in contrast with 14A and 14B. Here there is more rugged relief, and the cropped area occupy isolated valleys.

THE MIXED REGION OF CENTRAL BURMA

This region has less rainfall than the surrounding ones, owing to high lands to the west and to the south. The rainfall is not only light but erratic as well. The extent to which diversification has been realized in the agricultural practice of the region is brought out in the following list:

rice	20% of cropped area
sesamum	17% of cropped area
grain sorghums	14% of cropped area
beans	12% of cropped area
groundnuts	10% of cropped area
cotton	8% of cropped area
fodder	7% of cropped area
maize	6% of cropped area

The presence of crops other than rice, and the comparatively high acreage of each, reflect an environmental complex that is quite different from that of the region to the south (14).

MIXED CROP REGION OF EASTERN BURMA

The eastern boundary of this region coincides with the Shan States. This region has a very rugged relief. In the higher altitudes crops of middle latitudes such as potatoes and certain berry fruits are raised. The growing of potatoes could be materially extended. Wheat is one of the important crops. The population here is sparse.

THE BURMA AND ASSAM FOREST REGION

Here we find large and extensive forests of teak and sal. Small patches of land have been cleared in these forests, in which rice and tea are grown. The danger of wild animals, however, has been a factor checking further production. In this region there are favorable prospects for more extensive development in forestry and in plantation agriculture.

THE NORTHERN BRAHMAPUTRA VALLEY TEA REGION

This area receives a large amount of rainfall. This has given rise to extensive forests. Timber from sal and teak is sold to the adjacent treeless areas, especially the Gangetic Plain to the south. Agriculture rather than forestry, however, is the dominant economic activity of the area. Rice and tea are grown. Tea plantations occupy about one-eighth of the total area of this region.

FOR A REVIEW OF THE *GEOGRAPHIC REGIONS OF INDIA**

FLOY HURLBURT
University of Nebraska

I. Introduction
   A. What contrasts are found in India?
   B. To what two factors are these contrasts due?
   C. What basis may be used for dividing a country into regions? into provinces?
   D. What basis is used for the division of India into regions?
   E. Upon this basis how many regions are recognized in India and Burma?
II. Description of the Geographic Regions of India
   A. Lower Ganges Rice and Jute Region
      1. Where is this region located?

* Prepared under the direction of Associate Editor E. E. Lackey

2. What type of soil is found here?
3. Describe the rainfall and drainage conditions
4. What crops are raised?
5. Does the region support a dense or sparse population?
6. How is this made possible?

B. Lower Middle Ganges Region
1. In what respects is this region similar to the first?
2. In what respects do the two differ?

C. The Upper Ganges Wheat Region
1. Is the wheat of this region of the winter or spring variety? Why?
2. What crops are raised in addition to wheat?
3. How is moisture secured for agriculture?

D. The Punjab
1. Where is the Punjab?
2. What is its area?
3. How much of the land is cropped?
4. What percentage of the wheat crop of India is grown in the Punjab?
5. What progress has been made in this region during the past thirty years?
6. Who are the Sikhs?
7. What economic conditions have influenced their attitude toward the British?

E. The Northern Mountain-Health Region
1. Where are the highest mountains in the world?
2. Why are these mountains of value to Europeans living in India?

F. The Sind Rice Region
1. What system of irrigation is practiced in this region?
2. Irrigation makes possible the cultivation of what important crop?
3. In what respect does the Sind differ from the agricultural regions already discussed?

G. The Desert
1. What part of India is desert?
2. Are the density of population and the habits and occupations of the people such as one would expect to find in a desert?

H. Central Wheat and Sorghum Region
In what respect does this region differ from the Punjab and the Upper Ganges regions?

I. The Deccan
1. How does the Deccan compare in size with the other geographic regions of India?
2. Compare the four provinces of the Deccan with reference to crops, rainfall, soils and utilization of the land

J. The West Coast Rice Region
1. What type of topography is found here?
2. What per cent of the land is under cultivation?
3. What crops are grown?
4. Into what two provinces is the region divided, and why?
5. What use is made of the rough hill land?

K. The East Coast Region of "Summer" Rain
1. What unique feature gives this region its name?
2. Into what two provinces is it divided and why?

L. The Bihar and Orissa Rice Region
   1. Why is rice the dominant crop?
   2. What other crop of great importance is raised?
   3. What two minerals are produced?
   4. Where do most people live?
   5. Is the population relatively dense, or not?

M. The Rice Region of Burma
   1. How many crops of rice are produced a year?
   2. What secondary crops are raised?
   3. What four provinces are recognized?

N. The Mixed Region of Central Burma
   1. Why is the rainfall lighter than in the surrounding regions?
   2. What eight crops are raised?

O. The Mixed Crop Region of Eastern Burma
   1. Characterize this region with regard to relief, type of crops, density of population

P. The Burma and Assam Forest Region
   1. What valuable woods are found in the forests?
   2. What use is made of the small clearings?
   3. What prospects does the future hold for the region?

Q. The Northern Brahmaputra Valley Tea Region
   1. What is the dominant economic activity of the region?
   2. What two important crops are grown?
   3. What valuable resource is due to the heavy rainfall?

A FORECAST OF SOME THINGS ONE MAY LEARN FROM THE ARTICLE

on

*The River System: A Study in the Use of Geographic Technical Terms.**

1. The need for a more uniform nomenclature in geography.
2. The difference between technical and non-technical terms.
3. What a river is.
4. How to decide what term to use.
5. The need for consideration of closely related terms as illustrated in the use of the expression *river system.*
6. Why the term *drainage basin* needs to be used with discretion.
7. How a *drainage basin* differs from a *river basin.*
8. Why the term *master stream* is better than the term *trunk stream.*
9. The distinction between *water shed, water parting, divide* and *drainage divide.*
10. How to distinguish between *tributary* and *affluent.*
11. What a *natural levee* is.
12. Meaning of the term *distributary.*
13. The relation of *distributaries* to delta making.
14. The meaning of *anabranch* and *braided* as applied to streams.
15. How braided streams are made.
16. What a river system really is.

* Prepared under the direction of Associate Editor E. E. Lackey

THE RIVER SYSTEM: A STUDY IN THE USE OF TECHNICAL GEOGRAPHIC TERMS*

MARIUS R. CAMPBELL
United States Geological Survey

TECHNICAL AND NON-TECHNICAL TERMS

Students of geography are confused in the use of technical terms for land and water features, because the terms used by one author may not be the same as those used by another, more than one term may be employed in describing a single feature, and the terms that are used may appear, even to a beginner, to be meaningless or inappropriate. The present brief paper is written for the purpose of calling attention to some of these difficulties and, if possible, of helping the student to judge for himself regarding the value and proper use of a term.

In a study of geographic names it is important to distinguish between technical and non-technical terms and this distinction is not always easy to make for there is frequently a gradual transition from one into the other. A technical or scientific term is supposed to carry with it, either expressed or implied, a very definite idea of the character of the thing, process or condition to which it is applied; and the name also indicates its relation to other members of the same general class; whereas a non-technical or common term carries no such implication regarding the leading characteristic of the object in question. Thus the term "hill" must be regarded as non-technical because height is the essential element of a hill but the term conveys no definite idea as to what height is required to place a given elevation in the "hill" class. "River" is another term that is non-technical since the elements of volume and length are what distinguish it from other streams, and yet the term carries no implication as to what the size and length of a river should be. The student can doubtless think of many other terms which, judged by the criteria given above, fall naturally into this class.

RIVER SYSTEM

In a close study of geographic terms, it is generally unsatisfactory to take up a single term and attempt to determine whether

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it is appropriate or not, because the value of a term depends largely upon its relation to other terms applied to similar features of the same general class. Because of this fact it is desirable to consider groups of terms, the subjects of which are generically related. An excellent subject for such a study is a river system.

As the central figure in such study is a river, it is necessary first to define that term. A river is a body of water of considerable size, flowing generally in a natural channel across the land. It must be specified in the definition that the water flows, else a river could not be differentiated from a narrow lake or pond, and also that it flows in a natural channel to distinguish it from a canal. As the term "river" is not strictly a technical term, as stated above, it is impossible to give it a more exact definition.

Having disposed of the term "river" (and the names of minor streams such as "creek," "brook," "rivulet" and "rill" belong to the same category) we shall pass to the consideration of a river system. A river system consists of a system or group of rivers so united that the water carried by the minor component streams finally unites in one body of flowing water, usually designated as the "trunk" or "master" river. Here the reader is doubtless thinking, if not saying: "He violates the principle of no duplication which he advocated in a preceding paragraph." And the writer will plead guilty, unless he can show that the two terms convey different and desirable concepts to the mind of the reader. Thus, if we think of the ground plan or map of a river system, we instinctively compare it with a tree, and hence the principal stream is the "trunk" but, if we think of the comparative volumes of the rivers composing the system, then it is better to call it the "master river."

RIVER BASIN

What name or names shall we apply to the land area occupied by a river system? As the territory drained by a river system is always surrounded, except at the point of egress, by higher land than that over which the various rivers flow, we generally speak of it as a "basin" or "drainage basin;" but these terms are also appropriately applied to depressions in the surface of the land, which are not drained by a river, therefore it is better to use the term "river basin" which clearly indicates the kind of basin we are considering.

The rim which surrounds a river basin, except at the point of outlet, is usually referred to as a "watershed," "divide," "water parting," or drainage divide," but these terms are all open to more or less serious objection. Thus the term "watershed" is in common use, but fortunately some authors apply it to the rim surrounding a river basin and others to the surface of the basin itself. The English verb to shed means to throw off, hence a roof is a watershed because it throws off the water or rain. Similarly all of the slopes of a river basin shed more or less of the water that falls on them and thus are watersheds. The word watershed, however, as applied to the rim of a river basin comes from a German word meaning to part or divide. Etymologically then, it is strictly correct to apply this name to the rim surrounding a river basin but, as we have just seen, the word of German origin is in direct conflict with the English word. The conflict leads to great confusion and as both terms occur frequently in the literature, both should be abandoned so as to avoid misunderstandings in the future.

The term "divide" is nearly as objectionable as the term "watershed" for it is applicable to anything that divides or separates other things. For instance, Chesapeake Bay divides Maryland into two parts and consequently it is a divide just as truly as a ridge is a divide. The terms "drainage divide" and "water parting" are occasionally applied to the rim of a river basin, but each of these terms is of generic rank and is applicable to any ridge that separates two drainage basins, no matter what their size may be, nor how they may be drained. Thus the drainage basin of Great Salt Lake is surrounded by a drainage divide or a waterparting, altho the lake and not a river is the main receptacle for the water which is brought to it by a number of short streams. On the whole, "drainage divide" and "water parting" are the best terms yet proposed for the rim of a river basin, but in using either of these terms the student should be careful to explain fully to what kind of drainage basin he refers.

AFFLUENTS AND TRIBUTARIES

We have now to consider names for the smaller streams that, together with the master river, make up the system. If we examine the map of a river system or of its drainage basin, we shall find that some of the minor members of the system flow directly into

the master river, but by far the greater number do not; they flow into some other stream which may or may not discharge into the master, but eventually all of the water reaches that river and is carried away by it. Obviously then, we have occasion frequently to distinguish between those branches which flow directly into the master river and those which do not, and the most convenient and logical way of making such a distinction is to divide all of the minor drainage-ways into two classes and give them distinctive names.

There is today only one term that is commonly applied to the minor members of a river system and that is the word "tributary." What does the word "tributary" mean and why do we use it for these minor streams? A tributary stream is merely one which brings water to or contributes to the volume of water in another stream; hence all minor members of a river system are tributaries of the master river. The term "tributary" however, is frequently given a specific meaning and applied only to streams which unite with their master river. This usage is unjustifiable and should be condemned because the stream which unites indirectly with its master stream is just as truly a tributary as one which unites directly. The only term which has been definitely proposed for a stream that unites directly with another is the word "affluent." This word is from two Latin words meaning to flow to or towards, and consequently it is strictly appropriate, altho in the past it has had only a limited use.

Distributaries and Braided Streams

In addition to the streams which contribute water to the trunk stream, many river systems include streams which separate from the trunk. These occur generally on a broad flat floodplain where the trunk stream, in times of flood, drops part of its load near the channel and thus builds an embankment, generally known by the appropriate name of a "natural levee." These natural levees hold the flood water within the channel until the water reaches such a height that it overflows its barriers and then the concentrated current cuts one or more channels across the natural levee. Many of these channels are abandoned when the flood subsides, but occasionally one is cut so deeply that it persists and thus gives rise to a new river appropriately called a "distributary," because it takes water from its master stream and does not return it. Dis-

tributary streams are found generally on large deltas such as that of the Nile and the Mississippi, but they may also form on rather steep alluvial slopes where a stream is so heavily loaded with sediment that it is continually dropping part of its load in one place and picking it up in another. Such a stream shifts its channel frequently and in this manner distributaries may be formed.

A stream heavily loaded with sediment not only throws off branches (distributaries) which find courses separate and apart from that of the main river, but it may also send off branches which, after flowing for some distance in individual courses, return to the parent stream. The only name that has been applied to such a stream is "anabranch," an abbreviation of "anastomosing-branch." The term anastomosing-branch is too long for common use and its abbreviation has not been generally accepted by geographers, altho it was proposed in 1834. If this term is not acceptable, the only one that can be used is the term "braided" which is applied to the master stream and all the branches which interlock with it. The difficulty in the use of this term is that some streams divide into subordinate channels because of rocky islands in their courses, and the pattern of such streams is similar to the pattern of streams that are braided as a result of the sediment they have dropped. Strictly speaking, the definition of the term "braided" which was given when the term was proposed, can be applied only to the latter class. However, as the term "braided" merely has reference to the pattern of the interlocking channels and not to the manner in which they were formed, the term should not be restricted to streams whose pattern is controlled by the dropping of sediment, but should be applied to any and all streams the channels of which have the form of a braid. The term "braided" therefore is generic in rank, the genus consisting of two species: (1) Streams whose braided pattern is due to the dropping of sediment carried by the stream, and (2) streams whose braided pattern is due to channels eroded in a rocky floor. As these two species have not been definitely recognized and named, the opportunity is offered to some student with a lively imagination and an inventive turn of mind to propose appropriate names.

EVERY RIVER THE TRUNK OF A RIVER SYSTEM

In conclusion we must remember that the term "river system" is elastic and may with propriety be applied to any river, large or

small, which has affluents. The largest river system in this country is the Mississippi, which is composed of a trunk stream, several affluents, and tributaries unnumbered. The term is also applicable to the Rio Grande which is a long stream with a few affluents and tributaries, and it is also appropriate for a river which forms part of another river system. Thus it is proper to speak of the Ohio River system, because it has all of the essential elements of a system, as we have defined it, and the same is true of hundreds of rivers which are affluents or tributaries of other streams.

AN INTEREST-STIMULATING DEVICE

A Reviewing Game

On Friday of each week each pupil in the class selects from the week's lessons 15 questions which make a review of the week's work. It is then determined by lot whether the boys or the girls will ask the questions first. Then the "baseball" game begins. For example, if a boy answers the first question correctly he goes to first base and on to second base as the second boy answers and so on around to home. When three answers are missed the boys are out but if they answer the fourth correctly they get one score.

A variation of this same game is to line the boys up on one side and their girls on the other. If a boy misses a question asked by a girl it is passed to the next boy and on and on until the question is answered. The girls take to their side as many boys as have missed, and have the privilege of choosing whatever boys they prefer to have on their side. Then the boys have the privilege of asking questions of the girls and selecting as many as fail to answer. Both of these games have proven very effective methods of reviewing each week's work. All students plan for and look forward to the Friday's game with great interest. It has proven to be an effective interest-stimulator.

Mrs. Mollie George Adams
Woodrow Wilson Junior High School
Tampa, Florida.

Have You Games or Other Devices?

It is probable that hundreds of teachers have worked out hundreds of geography games, puzzles, devices for use of pictures, maps, diagrams, lantern slides, etc., that would be of great assistance to others. Will you co-operate by writing out a clear description of one or a dozen that you have developed and send to the *Editor* of the *Journal?* Send us any teacher-aid and interest-stimulator that you have devised. Make your description as brief as is consistent with clearness. We will undertake to pass a large number of these devices on as an aid to others. Success depends upon your assistance. Write us at once.

GEOGRAPHICAL PUBLICATIONS

Mark Jefferson. **Peopling the Argentine Pampa.** Research Series No. 16, 211 pp., 67 maps, diagrams and photos. American Geographical Society, N.Y. 1926

Peopling the Argentine Pampa was "written as a result of a journey made in 1918 on behalf of the American Geographical Society to study modern European colonization in Chile, the Argentine Republic, and Brazil." The author, ably fitted for such a study, brings into this volume the unique experience of a residence in Córdoba and Tucuman from January, 1884, to November, 1889, and therefore has an intimate knowledge of a period now closed. To those acquainted with the evolution of Argentina from a pastoral into an agricultural empire it is evident that this is near the beginning of this transformation; and the author's chief aim aptly put has been to draw "a picture of a vigorous infant agricultural society born in the midst of an ancient cattle culture."

At the time of his writing "The Argentines do almost half the business of the continent, though the other South American countries outnumber them fully seven to one. But where did they get so much money to spend?" In this development of riches both historical and geographical elements have had their part and as such are presented in Chapter I. What part immigration played in the peopling of the Pampa and how this was influenced by political consideration is told rather briefly in Chapter II. The next four chapters are devoted to the planting of colonies in the provinces of Santa Fe and Entre Rios. Chapter VII on "The Railroads and the Transformation of Agriculture" has little on the railroads but dwells chiefly on what the author earlier defines as the historical element such as the "Creole Attitude Toward the Immigrant," "Growth of the Renting System" and the like. Chapter VIII, the last chapter in the book, is on "Immigration as an Asset to the Argentine." The book closes with an appendix of detailed tables on Argentine immigration and emigration. There is also a set of three page-size maps showing the growth of cities and railroads in three periods from 1867 and 1869 to 1920. The book is excellently indexed.

The reader who is fairly familiar with Argentine geography can profit materially by the reading. The book as well as some of the chapters would seem to be badly misnamed. The title COLONIZATION IN ARGENTINE would seem to be much more descriptive of the textual matter than PEOPLING THE ARGENTINE PAMPA. Surely some of the colonies discussed cannot be thought of as being within the Pampa, nor has the discussion touched on the peopling of the whole of the Pampa. The study of Oscar Schneider on the "Alteration of the Argentine Pampa in the Colonial Period" (Univ. of Calif. Pub's. in Geogr., Vol. 2, no. 8, pp. 303-321, 1927) is more in line with

what one might expect from the title of the text. The extremely limited use of connectives, the juxtaposition of sentences not directly related in thought and the general absence of building the mass of material into a unit-whole makes this book, in the main, hard to read and useable more for reference than for general reading. The reader, however, who is interested in more than the somewhat superficial interpretation given to the evolution of Argentina by many writers will find this volume of real value in helping him to make his own interpretations.

Northwestern University W. H. HAAS

Clarence F. Jones. **Commerce of South America,** xvi and 584 pages; illustrated, Ginn and Co., Boston, 1928.

Commerce of South America should attract a numerous and varied audience. Sections that have been published elsewhere are now assembled with additional chapters in book form. The single chapters devoted to each of the ten independent countries of South America are prefaced by an introductory chapter entitled "The Character and Distribution of South American Trade," and two additional chapters are appended, one on the Guiana dependencies and a final one on "The United States and Its Chief Competitors in South American Trade." The slight variation in the titles of the several chapters, such as "The Evolution of Brazilian Commerce," "The Commercial Growth of Peru," and "The Rise of Paraguayan Commerce" is suggestive, but perhaps hardly indicative of differences in trade developments.

In this book the geography teacher will find a thoro and comprehensive treatment of the growth and changes in the commerce of the several countries. The many diagrams present in an impressive manner the distribution of exports and imports by countries and in some cases by commodities. These give not only the recent situation but the pre-war status. It is suggested that the size of the circles might have been drawn proportional to value of the trade and thereby increased their usefulness.

A selected bibliography includes most of the standard references. The crediting of V. C. Finch as co-author with R. H. Whitbeck of "Economic Geography of South America" is certainly a forgivable slip in so fine a production. Unfortunately the book will be out of date shortly, for there are sure to be rapid changes in the commerce of South America in the next ten years as in the last decade. The student of South America cannot content himself with this book alone, he will have to consult more recent sources to keep abreast of the times. Its distinctive geographic quality recommends it as a supplementary reference of the foremost importance.

University of Illinois GUY-HAROLD SMITH

J. J. Weber. **Picture Values in Education.** 156 pp. 29 illustrations. The Educational Screen, Chicago. 1928.

The larger part of this book is devoted to a description and interpretation of five experiments in the field of visual instruction:

1. An attempt to measure the relative effectiveness of the stereograph, the lantern slide, and the photograph by means of the silent observation span or the length of time the individual examines each of these of his own accord.

2. The effect of perspective and color measured by means of the silent observation span.

3. The relative value of the stereograph, lantern slide, and the photograph in producing observation, measured by means of a free-recall report.

4. The effectiveness of the stereograph in increasing ideational learning measured

by means of a free-recall report, an oral questionnaire, a yes-no judgment test based on visual memories, and the preference of the person being tested as given in a concealed test.

5. An experiment similar in most respects to Experiment 4 except that the lantern slide is substituted for the stereograph.

Following the account of these experiments is a description of the technique of measuring the effectiveness of visual aids and a summary of the results of the five experiments.

A supplement gives a digest of experiments which are published in greater length in "Comparative Effectiveness of Some Visual Aids in Seventh Grade Instruction" by the same author which has been reviewed in a previous issue of this magazine, and an outline for a course of study in visual instruction.

The experiments were conducted scientifically and interpreted in a careful manner. The book is of interest and value in giving information regarding how to conduct experiments in the field of visual instruction and in setting forth what these particular experiments imply.

Schenectady, New York ALFRED E. GILBERT

Ethel I. Salisbury. **From Panama to Cape Horn.** 294 pp. World Book Company, Yonkers-on-Hudson. New York. 1927. $1.40.

Miss Salisbury has written a geographical reader different from the usual type. She pictures vividly the plant and animal life of South America. She has traced the relationship between the life of the people and their environment. The casual side of geography is emphasized. The economic phase is not neglected as the chapters on Rubber and Coffee indicate. She appeals to the children's love of adventure and mystery in the chapters, "A Treasure Box," "The Buccaneers," "The Empire of the Incas."

The pictures, altho small, are well selected and clearcut. They give you glimpses of the land as it really is—jungle, mountain, valley and coast. Many black and white maps are scattered thru the book for ready reference.

At the close of each chapter is a list of "Things to do and think about." This advice provides a means for the child to check himself on his reading.

This little book should be a welcome addition to the schoolroom because it does not duplicate any other geographical reader on South America.

University of Pittsburgh ZOE A. THRALLS

James Ritchie. **The Influence of Man on Animal Life in Scotland. A study in Faunal Evolution.** 550 pp., 90 figures, 8 maps, Cambridge University Press, London, 1920. £1 9s.

School boys are commonly much interested in the larger animals, and the struggles man has had with them. In this scholarly work by a Keeper of the Royal Scottish Museum is a very readable account of the larger animals of Scotland and the changes which have taken place in the fauna during historical times. Bears, wolves, and malaria-carrying mosquitos formerly were numerous and destructive, but are now gone. On the other hand, numerous species have been introduced and have become numerous. The chapters on prehistoric sheep, horses, cattle and swine and their subsequent changes will interest all farm boys. The book is well illustrated. It should be in numerous school libraries, available to teachers of geography, agriculture, biology and history.

Indiana University S. S. VISHER

David Brunt. **Meteorology.** 112 pp., 6 photos, 7 maps, 6 diagrams. Oxford University Press, American Branch, N.Y. 1928.

This inexpensive little book by a scientifically well-known member of the British Meteorological Office should be serviceable to teachers who wish to learn more about the atmosphere, and who do not care to undertake one of the larger books on meteorology. The discussions of the important topics of theories of the origin of cyclonic storms and the motion of the upper air, however, are fuller and more valuable than are the corresponding parts of most of the older meteorologies. Weather forecasting is not discussed. One fourth of the book deals with atmospheric temperatures. Altho the author has avoided the use of mathematics, a considerable number of terms which are unfamiliar to the general reader are used and there is no glossary.

Indiana University S. S. VISHER

Wallace W. Atwood and Helen Goss Thomas. **Home Life in Far-Away Lands.** 166 pages, 197 pictures and 11 maps. Ginn and Company, Boston, 1928.

The rapid change to the one-cycle plan in geography textbooks in the United States is interesting to watch. The text which has just made its appearance is the first book of another new series on the one-cycle plan.

"Home Life in Far-Away Lands" introduces the pupil to geography by means of a number of imaginary journeys to the homes of children in other lands. Seven main units are used in the following order: A Visit to the Belgian Congo; Eskimo Life in Baffin Island; Nomads of the Arabian Desert; Farmer-fishermen of Norway; Polder Farmers of the Netherlands; Peasants of Northern France; Mountaineers of Switzerland.

In each of the units the authors effectively show how the people of the region have fitted themselves into the complex of their natural environment. Cause and effect is carefully stressed in all cases. Each unit is followed by sets of tests which teachers will find helpful. Great pains have been taken to introduce and define the names of land and water forms encountered in the various journeys.

The pictures are numerous, well chosen and in the main highly geographic. Some use is made of sun-behavior sketches, a topic but recently introduced into elementary geographies in this particular form. The reading material is easily within the range of fourth grade and the type is particularly good.

Figures 15 and 18 introduce two views of the globe in green, brown, and gray. The caption beneath states "the lands colored green have enough rain so that they are covered with grass and trees . . . ." In view of the fact that most of the wall maps used in class rooms use green to indicate lowland is not this change likely to prove confusing to children?

Clark University ALISON E. AITCHISON

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the enlarged size of your *Journal?* Examine again the quantity and quality of solid text material in recent issues! This has been made possible by the growing interest and support of geography teachers everywhere, and the generous cooperation of our publishers—A. J. Nystrom and Company—who are doing everything possible to make the *Journal* bigger and better. You can help a great deal by 1) placing the *Journal* in your school library, 2) by renewing your subscription, and 3) by getting at least one new member. *You just can't afford to miss it. We hereby extend to you an invitation to become a member of the National Council of Geography Teachers and secure the Journal at the membership rate of only $2.00 a year.*

Here are some of the things scheduled to appear in the *Journal.*

1. The Selection of Subject Matter for Geography in the Elementary School. Frank M. McMurry, Teachers College, Columbia University, New York City
2. Geography and World Citizenship. L. O. Packard, Teachers College of the city of Boston
3. Qualifications Requisite for Teaching Geography. Zoe A. Thralls, University of Pittsburgh
4. Industrialized Geography. H. W. Fairbanks, Glendale, California
5. The Iron and Steel Industry of the United States. Richard Hartshorne, University of Minnesota, Minneapolis
6. Some Frontier Conditions in the Hilly Portions of the Ozarks. W. A. Browne, Teachers College, Nacogdoches, Texas
7. The Agricultural Industries. O. E. Baker, Senior Agricultural Economist, U. S. Department of Agriculture
8. The Commerce of the United States. Helen M. Strong, Geographer, U. S. Bureau of Foreign and Domestic Commerce
9. Geography in Educational Institutions Above the High School. Ida M. Shrode, Junior College, Pasadena, California

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STATE TEACHERS COLLEGE
MANKATO, MINN.

MAP OF THE ANTARCTIC

In Two Colors

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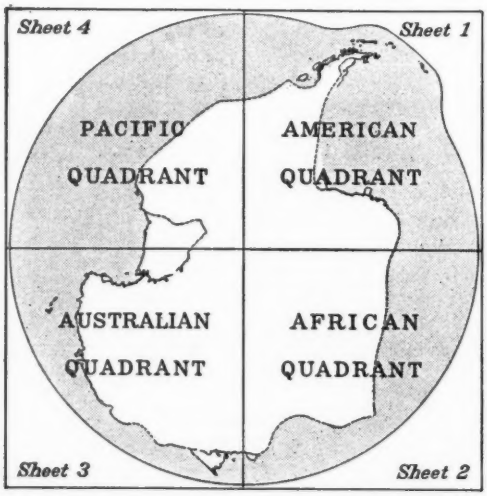
THE AMERICAN GEOGRAPHICAL SOCIETY
BROADWAY AT 156TH STREET, NEW YORK



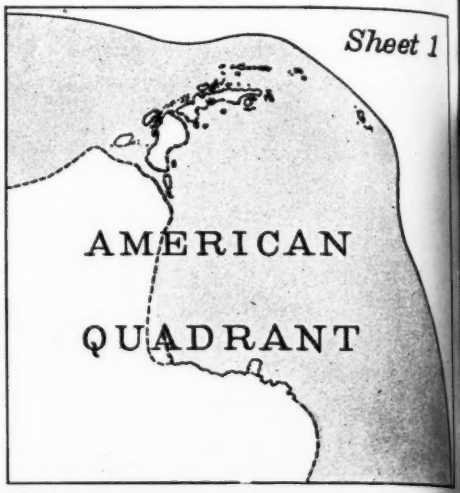


Fig. 1 is a key map on a very small scale showing how the large map is put together. Each of the four sheets covers a quadrant of the Antarctic and is 32 inches by 32 inches in size. When the four sheets are assembled, as shown in the key above, they make a map 5 feet square.

Fig. 2 shows how the outlines of the American Quadrant of Antarctica, covered by Sheet 1, have been changed by the recent flights made over Graham Land by Captain Sir Hubert Wilkins. (A corrected copy of the American Quadrant will be sent to purchasers of the map when Captain Wilkins' complete scientific report is received.)

This is the last generation to witness the exploration of a continent. Commander Richard E. Byrd and Captain Sir Hubert Wilkins are now conducting two scientific expeditions to the Antarctic. Already important changes have been made in the Graham Land sector by the recent flights of Captain Sir Hubert Wilkins. To follow the discoveries, as reports from these two expeditions continue to come in, you need this new large-scale map, which every student of geography can read clearly, and upon which you can plot new coast-lines, mountain ranges, airplane flights, and base camps as reported by radio from within the Antarctic Circle. The American Geographical Society's *Map of the Antarctic* is made especially for this purpose. It is reproduced from precisely the same drawings as those from which the Society printed the base maps it supplied to the Antarctic expeditions of Commander Richard E. Byrd and Captain Sir Hubert Wilkins, and it is the only large-scale map of the Antarctic now available. Over seventy-five original sources were employed in its compilation.

With each set of the *Map of the Antarctic* is sent the *Navigational Chart of the Antarctic*, which is identically like the chart which the Society prepared for Commander Byrd and Captain Wilkins. There is also included an eight-page Explanatory Note describing the construction and use of the map.

The price of the **Map of the Antarctic** is $10.00. The **Navigational Chart** may be purchased separately for $1.00 per copy. In lots of 20 or more, for classroom use, the **Navigational Chart** sells for $15.00.

A circular describing the map in fuller detail will be sent on request.